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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/067,516

02/04/2002

Mark A. Handschy

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03/19/2004

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EXAMINER

THOMPSON, TIMOTHY J

ART UNIT

PAPER NUMBER

2873

DATE MAILED: 03/19/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/067,516

Applicant(s)

HANDSCHY ET AL.

Examiner

Timothy J Thompson

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 10-22, 26-28 and 31-38 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 36 and 38 is/are allowed.
- 6) ☒ Claim(s) 10, 13, 14, 16-22, 26, 27, 31-35 and 37 is/are rejected.
- 7) ☒ Claim(s) 11, 12, 15 and 28 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 February 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |  |
|--|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)            |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>09/03</u> | 6) <input type="checkbox"/> Other: ____  |

**DETAILED ACTION**

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 26, 27, 31-33, 35, 37 are rejected under 35 U.S.C. 102(e) as being anticipated by Bryars(U.S. Patent No. 5,986,815).

Regarding claim 26, Bryars discloses a microdisplay(fig 1, 90) that lies substantially in a plane; a source of light(fig 1, 10) located proximate to the plane(the plane running parallel to the bottom surface of the microdisplay fig 1, 10), the source being oriented to direct light up and away from the plane(fig 1 and the plane as indicated previously); and an optical element(fig 1, 20) located above the support plane in position to direct the light from the source of light toward the microdisplay, the optical element being substantially further away from the microdisplay than is the source of light(fig 1 ), the reflector is a beam splitter(fig 1, 20).

Regarding claim 27, Bryars discloses the optical element includes a polarizing beam splitter(fig 2, 21).

Regarding claim 31, Bryars discloses a microdisplay(fig 1, 90) that lies substantially in a plane; a source of light(fig 1, 10) located proximate to the plane(the plane running parallel to the bottom surface of the microdisplay fig 1, 10), the source

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being oriented to direct light up and away from the plane(fig 1 and the plane as indicated previously); and an optical element(fig 1, 20) located above the support plane in position to direct the light from the source of light toward the microdisplay, the optical element being substantially further away from the microdisplay than is the source of light(fig 1 ), wherein each of the light source and the microdisplay have a primary optical axis, and further wherein these optical axes intersect with one another(fig 1).

Regarding claim 32, Bryars discloses a microdisplay(fig 1, 90) that lies substantially in a plane; a source of light(fig 1, 10) located proximate to the plane(the plane running parallel to the bottom surface of the microdisplay fig 1, 10), the source being oriented to direct light up and away from the plane(fig 1 and the plane as indicated previously); and an optical element(fig 1, 20) located above the support plane in position to direct the light from the source of light toward the microdisplay, the optical element being substantially further away from the microdisplay than is the source of light(fig 1 ), wherein the microdisplay is a reflective liquid crystal spatial light modulator(fig 1, 90).

Regarding claim 33, Bryars discloses the spatial light modulator is pixilated(col 12, lines 32-42).

Regarding claim 35, Bryars discloses wherein the beam splitter(fig 1, 20) is optically disposed between both the light source(fig 1, 10) and the spatial light modulator(fig 1, 90) and between the spatial light modulator and a source imaging area(fig 1, 150), the beam splitter directing light from the light source to the spatial light modulator and from the spatial light modulator to the source imaging area(fig 1).

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Regarding claim 37, Bryars discloses a microdisplay(fig 1), a source of light located proximate to the microdisplay(Fig 1, 10); and a reflector spaced apart from the microdisplay in position to reflect the light from the source of light to eventually illuminate the microdisplay(Fig 1, 20); wherein the source of light is closer to the microdisplay than to the reflector(fig 1).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 10, 13, 14, 16-20, 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bryars (U.S. Patent No. 5,986,815) in view of Hayase et al.(U.S. Patent Pub No. 2002/0009890).

Regarding claim 10, Bryars discloses a support surface; a source of light located proximate to the support surface; a microdisplay located proximate to the support surface; a reflector located above the support surface in position to reflect the light from the source of light to eventually illuminate the microdisplay. Bryars does not specifically disclose a support surface. However, Hayase et al. discloses a support surface for supporting an LCD matrix(fig 3A, 1). It would have been obvious to one skilled in the art at the time of the invention to use a support surface for supporting the LCD matrix as

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shown by Hayase et al., in the display device of Bryars, since as shown by Hayase et al., support surfaces are commonly used with an LCD matrix so as to maintain the matrix in the desired position relative to each other.

Regarding claim 13, 14, Bryars discloses the optical element includes a polarizing beam splitter(fig 1, 20).

Regarding claim 16, Bryars discloses the microdisplay is a reflective spatial light modulator(fig 1, 90).

Regarding claim 17, Bryars discloses elements positioned in a light path above the microdisplay(fig 1, 140), wherein the microdisplay is a reflective microdisplay(fig 1, 90), wherein the optical elements are receptive of light reflected from the microdisplay, the optical elements directing the reflected light for viewing(fig 1), and further wherein the reflector(fig 1, 20) is positioned in the light path between the microdisplay and the optical elements(fig 1).

Regarding claim 18, Bryars discloses wherein each of the light source and the microdisplay have a primary optical axis, and further wherein these optical axes intersect with one another(fig 1).

Regarding claim 19, Bryars discloses the microdisplay is a reflective liquid crystal spatial light modulator(fig 1, 90).

Regarding claim 20, Bryars discloses the spatial light modulator is pixilated(col 12, lines 32-42).

Regarding claim 22, Bryars discloses the beam splitter(fig 1, 20) is optically disposed between both the light source(fig 1, 10) and the spatial light modulator(fig 1,

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90) and between the spatial light modulator and a source imaging area, the beam splitter directing light from the light source to the spatial light modulator and from the spatial light modulator to the source imaging area(fig 1, 150).

Claims 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bryars (U.S. Patent No. 5,986,815) in view of Hayase et al.(U.S. Patent Pub No. 2002/0009890)as applied to claim 10 above, and further in view of Saito et al.(U.S. Patent No. 4,784,791).

Regarding claim 21, a modiofied Bryars, as detailed in claim rejection 10 above does not specifically disclose the spatial light modulator uses a ferroelectric liquid crystal. However, Saito et al. discloses a ferroelectric liquid crystal stating it has an improved response rate (col 1). It would have been obvious to one skilled in the art at the time of the invention to use a ferroelectric liquid crystal as shown by Hayase et al., in the display device of Bryars, since as shown by Hayase et al., a ferroelectric liquid crystal is commonly used in display devices for there improved response time.

Claims 34 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bryars (U.S. Patent No. 5,986,815) as applied to claim 32 above, and further in view of Saito et al.(U.S. Patent No. 4,784,791).

Regarding claim 34, Bryars, as detailed in claim rejection 32 above does not specifically disclose the spatial light modulator uses a ferroelectric liquid crystal. However, Saito et al. discloses a ferroelectric liquid crystal stating it has an improved

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response rate (col 1). It would have been obvious to one skilled in the art at the time of the invention to use a ferroelectric liquid crystal as shown by Hayase et al., in the display device of Bryars, since as shown by Hayase et al., a ferroelectric liquid crystal is commonly used in display devices for there improved response time.

***Allowable Subject Matter***

Claims 11, 12, 15, 28, are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. With the allowable features being the reflector is planar or curved or a polarizing holographic beam splitter.

Claims 36, 38 are allowed.

The following is an examiner's statement of reasons for allowance: The prior art taken either singularity or in combination fails to anticipate or fairly suggest the limitations of the independent claim, in such a manner that a rejection under 35 U.S.C. 102 or 103 would be proper. The prior art fails to teach a combination of all the claimed features as presented in independent claims 36, 38, with the allowable features being; the source light located within a distance of the microdisplay being less than the lateral extent of the generated image on the micro display. Therefore claims 36, 38 are allowed.



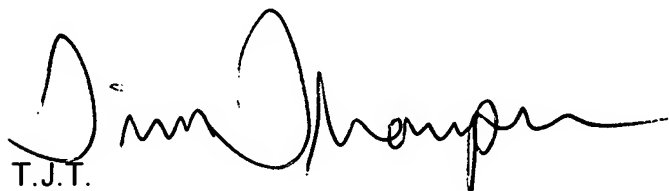
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Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

### Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Karasawa(U.S. Patent 5,278,680) and Rhoads(U.S. Patent No. 5,627,672) are pertinent to the application since they pertain to light modulators.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Timothy J. Thompson whose telephone number is (571) 272-2342. If the examiner can not be reached his supervisor, Georgia Epps, can be reached on (571) 272-2328.



T.J.T.

3/10/04